
Comprehensive Approach to the Management and Prevention of Early Childhood Caries

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Abstract

Dental caries is the most common disease of childhood that does not resolve spontaneously or respond to a course of antibiotic therapy. Tragically, children in Hawaii experience the highest incidence of tooth decay in the United States. This manuscript briefly explains the etiology of Early Childhood Caries (ECC), describes the consequences of this insidious disease process and outlines a comprehensive, multidisciplinary, preventive approach for Hawaii's health care providers.

Introduction

Bowen reported in 1991 that tooth decay remains the most prevalent disease affecting humans in America.¹ Edelstein and Douglass reported in 1995 that dental caries was the single most common disease of childhood that is not self-limiting or amenable to a course of antibiotics.² Dr. Mark Greer, State Department of Health, Dental Division recently reported that children in Hawaii have the highest incidence of dental caries in the United States.³

Tooth decay is an infectious disease.⁴⁻⁷ The bacteria, *Streptococcus mutans*, is typically passed from mother's saliva to child through oral contact.^{5,7} When the deciduous teeth begin to erupt into the oral cavity at six months of age, *S. mutans* form a plaque on the teeth that metabolize sugars in the diet of the infant. Acidic by-products retained beneath the plaque demineralizes the enamel matrix of the tooth crown and initiates a carious lesion.

Sucrose, glucose and fructose found in fruit juices and vitamin C drinks as well as in solids are probably the main sugars associated with infant caries. Animal studies also suggest increased cariogenicity of starch/sugar mixtures.⁸

From the literature, there is no evidence to suggest that bovine milk is cariogenic. Small epidemiological studies, however, have suggested that human milk and frequent breast-feeding is associated with a caries prevalence of around 5% to around 10%. Recent investigations reported that some common milk formulas have as much cariogenic potential as sucrose.⁸

The American Academy of Pediatric Dentistry recognize the distinct nutritional advantages of human milk for most infants, and endorses the American Academy of Pediatrics on the promotion of breast-feeding.

Early Childhood Caries

The condition properly termed Early Childhood Caries is commonly known as Baby Bottle Tooth Decay, Nursing Caries, or Rampant Caries. The onset of Early Childhood Caries may be within three months following the eruption of the deciduous teeth.⁹⁻¹¹

Barriers to effective treatment and prevention of ECC are lack of funding, lack of dental personnel who are adequately trained to treat infants and young children, lack of focus on primary prevention (infant dental exams by age 1 year old), and negative beliefs and experiences of mothers who control use of dental services for their children.¹²

The potential consequences of Early Childhood Caries are: acute and chronic pain due to oral infections, malnutrition, increased risk for dental disease in permanent teeth, increased incidence of tooth loss and malocclusion, diminished self-esteem, decreased learning due to distraction and absence from school, increased expense for dental care throughout life and compromised general health.

The American Academy of Pediatric Dentistry recognized that effective management and prevention of Early Childhood Caries requires a comprehensive, multi-disciplinary approach. The AAPD initiated the *Youthful Smiles* campaign in 2001 to integrate the services of health care providers, legislators, social workers, educators, and other professionals and agencies involved with children. The Hawaii Dental Association, through its Dental Samaritans program, recently introduced the *Saving Young Smiles* initiative to focus the public's attention on the problem of Early Childhood Caries, especially in the low income and welfare population. The non-profit facilities that provide services to the lower income population can only accommodate approximately 5,000 patients of the 150,000 people in this category. Unfortunately, none of these facilities target children in the critical 1-3 year age group, and many people are unaware that there are dental health care professionals who have additional years of education and specialized training to treat infants as early as 1 year old, known as pediatric dentists.

Management and Prevention

As the hard dental tissues are immunologically inactive, the host defense mechanisms involved in dental caries are centered around the prevention of colonization, and pathogenic activity of cariogenic bacteria.⁸

The American Academy of Pediatric Dentistry and the Hawaii Dental Association recognize that infants and toddlers will visit a pediatrician approximately twenty times before their first visit to a dentist. Most often, the child's first visit to the dentist is precipitated by oral pain secondary to the onset of Early Childhood Caries.

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Saving Young Smiles is an educational initiative intended to enlist the assistance of primary care physicians, nurses and other health care providers in the campaign to prevent Early Childhood Caries by providing parents of young children with the following recommendations:

- Child's first dental examination should be encouraged by age one year old so Early Childhood Caries awareness and prevention, proper oral hygiene, topical fluoride applications, and use of sealants may be reviewed.
- Nocturnal breast-feeding or use of a baby bottle with anything but water should be avoided after the eruption of the first tooth.
- Infants should be weaned from a bottle by 12-14 months of age and encouraged to drink liquids from a cup.
- Fluoride supplements for children should be encouraged, especially if they live in an area without fluoridated water.
- Oral hygiene homecare should be initiated by parents at six months of age and performed on a daily basis, especially for infants of mothers who have a history of tooth decay and oral disease.
- Parents must be encouraged to supervise oral hygiene care on a daily basis.
- Parents should be educated about the known association between frequent consumption of sugars, carbohydrates and dental caries.
- Support research, education, and appropriate legislation to promote ECC prevention.

Summary

The onset of Early Childhood caries in infants poses a significant challenge for the child, parents, health care providers, educators and the community. If this insidious infectious disease progresses undetected, it will likely lead to a lifetime of chronic oral disease for the affected individual.

Studies have revealed that regular tooth brushing and flossing do not adequately combat tooth decay. Refined sugars and fermentable carbohydrates are easily accessible and exposed to Hawaii's infants and children. Fluoride supplementation via topical applications or systemically via drops, tablets or fluoridated water is essential to optimal prevention of dental caries.

The concerted effort of obstetricians, pediatricians, nurses, Lamaze instructors and other allied health care providers is essential to the successful implementation of these measures to prevent Early Childhood Caries in Hawaii. Dentists and physicians must work together to encourage legislators to appropriate adequate funding for Medicaid programs that include preventive service for infants and children. Finally, pediatricians must assist pediatric dentists in the implementation of preventive oral health services that may be provided by the pediatrician's office staff, such as recommendations for balanced diets, and early infant oral exams by age one year old.

Innovation and collaboration can lead to the eradication of Early Childhood Caries in Hawaii. Please contact the Hawaii Dental Association at 808-593-7956 for additional information.

References

1. Bowen WH. Dental caries: is it an extinct disease? *J Am Dent Assoc* 1991; 122(10):49-52.
2. Edelstein BL, Douglass CW. Dispelling the myth that 50 percent of U.S. school children have never had a cavity. *Public Health Rep* 1995; 110(5):522-30.
3. Greer M. Status report on community water fluoridation in Hawaii. *Hawaii Dent J* 2002; 33(2):15.
4. Kohler B, Bratthall D. Intrafamilial levels of *Streptococcus mutans* and some aspects of bacterial transmission. *Scand J Dent Res* 1978;86:35-42.
5. Kohler B, Bratthall D, Krass B. Preventative measures in mother influence the establishment of the bacterium *Streptococcus mutans* in their infants. *Arch Oral Biol* 1983; 28:225-31.
6. Caufield PW, Walker TM. Genetic diversity within *Streptococcus mutans* evident from chromosomal DNA restriction fragment polymorphism. *J Clin Microbiol* 1989; 27:274-8.
7. Berkowitz RJ, Jones P. Mouth to mouth transmission of the bacterium *Streptococcus mutans* between mother and child. *Arch Oral Biol* 1985; 30:377-9.
8. Soew WK. Biological mechanisms of early childhood caries. *Comm Dent Oral Epidemiol* 1998; 26:8-27.
9. Lopez L *et al*. Early childhood caries and risk factors in rural Puerto Rican children. *J Dent Child* 1998; 132-5.
10. Tang JM *et al*. Dental caries prevalence and treatment levels in Arizona preschool children. *Public Health Rep* 1997; 112(4):319-31.
11. Ching B, Weddell J. Correlation between caries prevalence and socioeconomic status in children 6 to 36 months. Indiana University Master's Thesis 2000.
12. Horowitz AM. Response to Weinstein: Public health issues in early childhood caries. *Community Dent Oral Epidemiol* 1998; 26: Supplement 1:91-5.

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